

CLAIMS

What is claimed is:

- 5 *Sub A1* 1. A body implantable system, comprising:
at least one lead comprising an atrial electrode for sensing and pacing an
atrium of a heart;
10 a detector, coupled to the at least one lead, that detects high atrial interval
rates indicative of atrial arrhythmia;
 memory configured to define an atrial window having a first length and a
first satisfaction criterion; and
 a control circuit coupled to the detector and memory, the control circuit
inhibiting delivery of pacing signals to the atrium in response to detecting the high atrial
interval rates and the detector detecting atrial intervals while inhibiting delivery of the
pacing signals to the atrium, the control circuit classifying the atrial intervals in an atrial
window and declaring an atrial episode in response to satisfying the atrial window by
comparing classified atrial intervals to the first satisfaction criterion.
- 15 20 2. The system of claim 1, wherein the control circuit inhibits delivery of the
pacing signals in response to detecting high atrial interval rates indicative of atrial
flutter.
- 25 3. The system of claim 1, wherein the control circuit inhibits delivery of the
pacing signals in response to detecting high atrial interval rates of at least about 130
bpm.
- 30 4. The system of claim 1, wherein the control circuit inhibits delivery of the
pacing signals during a duration of a detection window initiated in response to detecting
high atrial interval rates indicative of atrial arrhythmia.

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5. The system of claim 1, wherein the detector detects an atrial event occurring within a post-ventricular atrial refractory period (PVARP), and the control circuit initiates a detection window in response to the sensed atrial event and inhibits delivery of an atrial pace signal during a duration of the detection window.
- 10 6. The system of claim 5, further wherein the detector detects a subsequent atrial event occurring before expiration of the detection window, the control circuit initiating a subsequent detection window in response to the sensed subsequent atrial event and inhibiting delivery of a subsequent atrial pace signal during a duration of the subsequent detection window.
- 15 7. The system of claim 1, wherein the control circuit inhibits delivery of the pacing signals to cause an increase in a rate of atrial window satisfaction.
- 20 8. The system of claim 1, wherein the control circuit enables delivery of the pacing signals to the atrium after ceasing of the high atrial interval rates indicative of atrial arrhythmia.
- 25 9. The system of claim 1, wherein the atrial window length ranges between 20 and 60 atrial interval samples.
10. The system of claim 1, wherein the first satisfaction criterion represents a predetermined number, percentage or ratio of atrial intervals classified as fast atrial intervals relative to the atrial window length.
11. The system of claim 1, wherein the first satisfaction criterion represents about 80 percent of atrial intervals classified as fast atrial intervals.

12. The system of claim 1, wherein the controller further verifies that the declared atrial episode is a sustained atrial episode in response to the atrial window being satisfied by a second satisfaction criterion for subsequent atrial intervals.

5 13. The system of claim 12, wherein each of the first and second satisfaction criterion represents a predetermined number, percentage or ratio of atrial intervals classified as fast atrial intervals relative to the atrial window length, and the second satisfaction criterion is less than the first satisfaction criterion.

10 14. The system of claim 13, wherein the first satisfaction criterion represents about 80 percent of the atrial intervals classified as fast atrial intervals and the second satisfaction criterion represents about 60 percent of the subsequent atrial intervals classified as fast atrial intervals.

15 15. A method implemented with an implantable medical device capable of sensing and pacing at least an atrium of a heart, comprising:
detecting high atrial interval rates indicative of atrial arrhythmia;
inhibiting delivery of pacing signals to the atrium in response to detecting the high atrial interval rates;
detecting atrial intervals while inhibiting delivery of the pacing signals to the atrium;
classifying the atrial intervals in an atrial window, the atrial window having a length and an associated first satisfaction criterion; and
declaring an atrial episode in response to satisfying the atrial window by
comparing classified atrial intervals to the first satisfaction criterion.

20 25 16. The method of claim 15, wherein inhibiting delivery of the pacing signals comprises inhibiting delivery of the pacing signals in response to detecting high atrial interval rates indicative of atrial flutter.

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17. The method of claim 15, wherein inhibiting delivery of the pacing signals comprises inhibiting delivery of the pacing signals in response to detecting high atrial interval rates of at least about 130 bpm.

5 18. The method of claim 15, wherein inhibiting delivery of the pacing signals comprises inhibiting delivery of atrial paces during a duration of a detection window initiated in response to detecting high atrial interval rates indicative of atrial arrhythmia.

10 19. The method of claim 15, further comprising:
detecting an atrial event occurring within a post-ventricular atrial refractory period (PVARP);
initiating a detection window in response to the detected atrial event; and
inhibiting delivery of an atrial pace signal during a duration of the detection window.

15 20. The method of claim 19, further comprising:
detecting a subsequent atrial event occurring before expiration of the detection window;
initiating a subsequent detection window in response to the detected subsequent atrial event; and
inhibiting delivery of a subsequent atrial pace signal during a duration of the subsequent detection window.

25 21. The method of claim 15, wherein inhibiting delivery of the pacing signals comprises inhibiting delivery of the pacing signals to cause an increase in a rate of atrial window satisfaction.

30 22. The method of claim 15, further comprising enabling delivery of the pacing signals to the atrium after ceasing of the high atrial interval rates indicative of atrial arrhythmia.

23. The method of claim 15, wherein the atrial window length ranges between 20 and 60 atrial interval samples.

5 24. The method of claim 15, wherein the first satisfaction criterion represents a predetermined number, percentage or ratio of the atrial intervals classified as fast atrial intervals relative to the atrial window length.

10 25. The method of claim 15, wherein the first satisfaction criterion represents about 80 percent of the atrial intervals classified as fast atrial intervals.

15 26. The method of claim 15, further comprising verifying that the declared atrial episode is a sustained atrial episode in response to the atrial window being satisfied by a second satisfaction criterion for subsequent atrial intervals.

20 27. The method of claim 26, wherein each of the first and second satisfaction criterion represents a predetermined number, percentage or ratio of the atrial intervals classified as fast atrial intervals relative to the atrial window length, and the second satisfaction criterion is less than the first satisfaction criterion.

25 28. The method of claim 27, wherein the first satisfaction criterion represents about 80 percent of the atrial intervals classified as fast atrial intervals and the second satisfaction criterion represents about 60 percent of the subsequent atrial intervals classified as fast atrial intervals.

29. A method implemented with an implantable medical device capable of sensing and pacing at least an atrium of a heart, comprising:

detecting, during an atrial arrhythmia, atrial events occurring within a post-ventricular atrial refractory period (PVARP);

- (1)
- initiating one or more detection windows in response to the detected atrial events;
- inhibiting delivery of atrial pace signals during the detection windows;
- classifying, while inhibiting delivery of the atrial pace signals, atrial intervals in an atrial window, the atrial window having a length and an associated satisfaction criterion; and
- declaring an atrial episode in response to satisfying the atrial window by comparing classified atrial intervals to the satisfaction criterion.
- 10 30. The method of claim 29, wherein inhibiting delivery of the pacing signals comprises inhibiting delivery of the pacing signals in response to detecting high atrial interval rates indicative of atrial flutter.
- 15 31. The method of claim 29, wherein inhibiting delivery of the pacing signals comprises inhibiting delivery of the pacing signals in response to detecting high atrial interval rates of at least about 130 bpm.
- 20 32. The method of claim 29, wherein inhibiting delivery of the pacing signals comprises inhibiting delivery of the pacing signals to cause an increase in a rate of atrial window satisfaction.
- 25 33. The method of claim 29, further comprising enabling delivery of the pacing signals to the atrium after ceasing of the high atrial interval rates indicative of atrial arrhythmia.
34. The method of claim 29, wherein the atrial window length ranges between 20 and 60 atrial interval samples.

35. The method of claim 29, wherein the satisfaction criterion represents a predetermined number, percentage or ratio of the atrial intervals classified as fast atrial intervals relative to the atrial window length.

5 36. The method of claim 29, wherein the satisfaction criterion represents about 80 percent of the atrial intervals classified as fast atrial intervals.

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